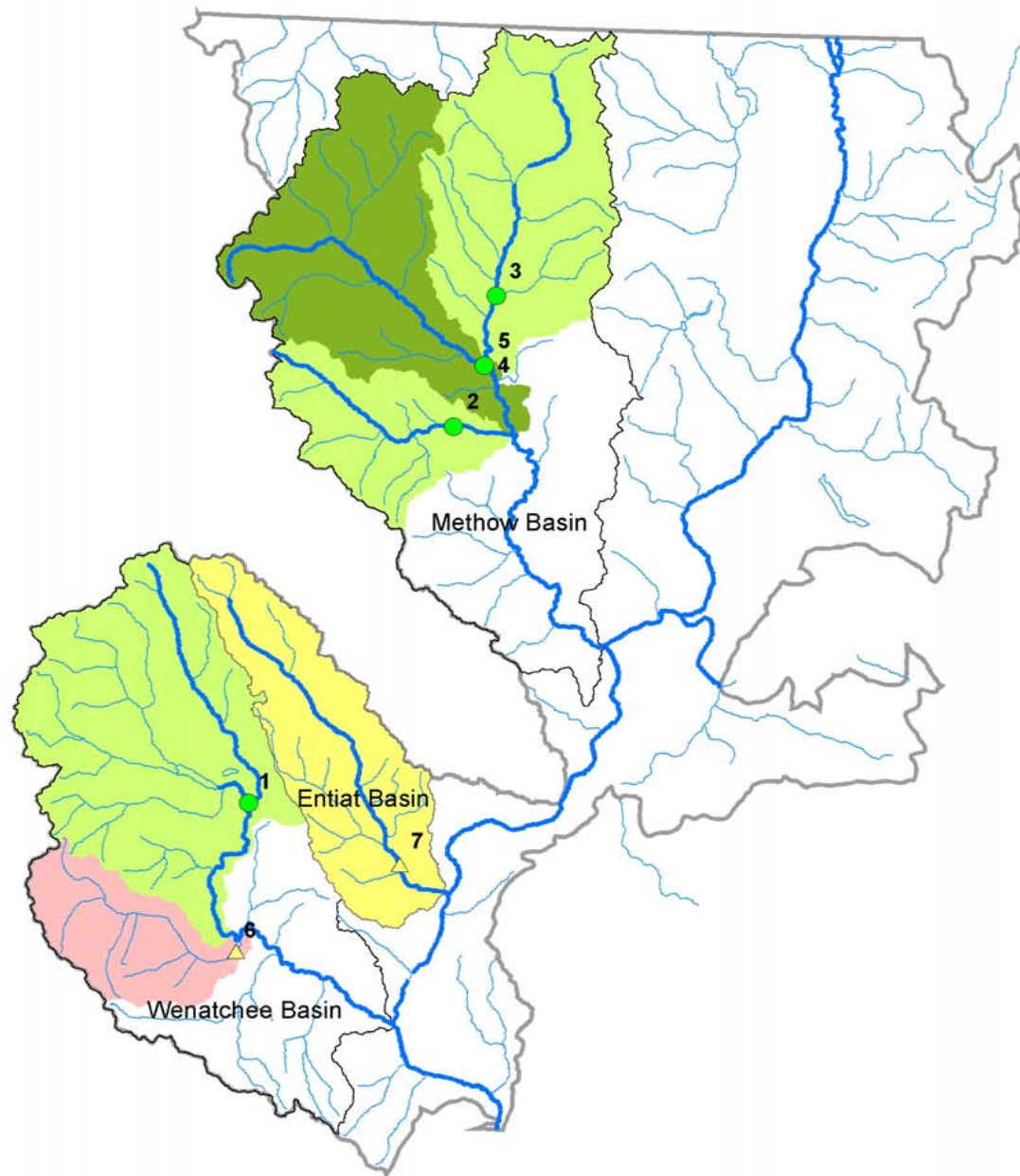


Upper Columbia Spring-run Chinook Salmon ESU

Artificial Propagation Review

Kristine Petersen

Salmon Recovery Division



- 1, Chiwawa Rearing Pond
- 2, Twisp Rearing Pond
- 3, Chewach Rearing Pond
- 4, Methow Hatchery
- 5, Winthrop NFH
- ▲ 6, Leavenworth NFH
- ▲ 7, Entiat NFH

Included in the ESU

- Integrated Programs
- Conservation
 - Wenatchee Basin
 - Chiwawa River \approx 672K smolts
 - White River \approx 150K smolts – Captive Broodstock Program
 - Methow Basin
 - Methow River (WDFW) \approx 184K smolts
 - Chewuch River \approx 183K smolts
 - Twisp River \approx 183K smolts

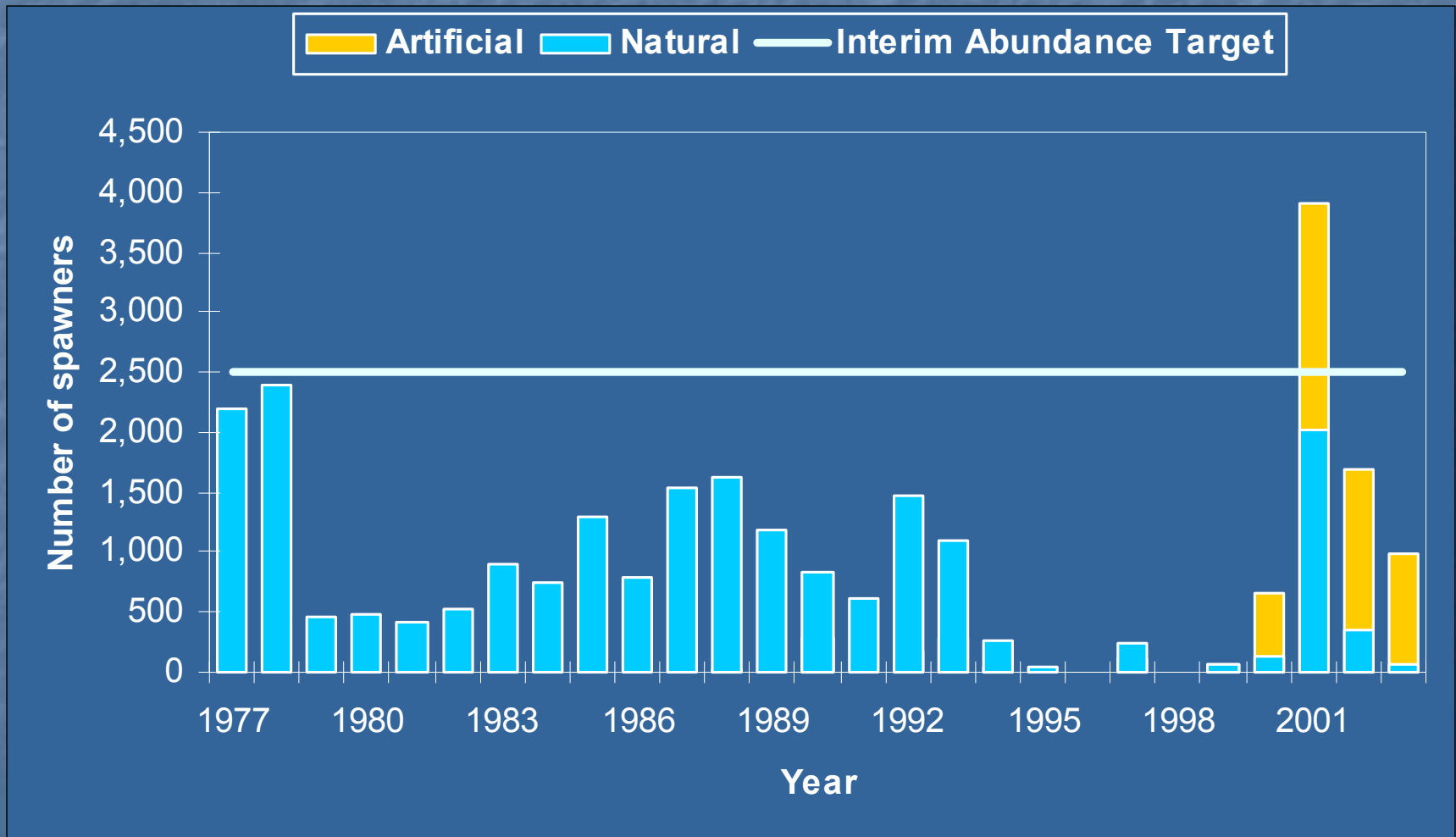
Included in the ESU (continued)

- Integrated Programs
- Conservation & Harvest Mitigation
 - Methow River
 - Winthrop NFH \approx 600K smolts

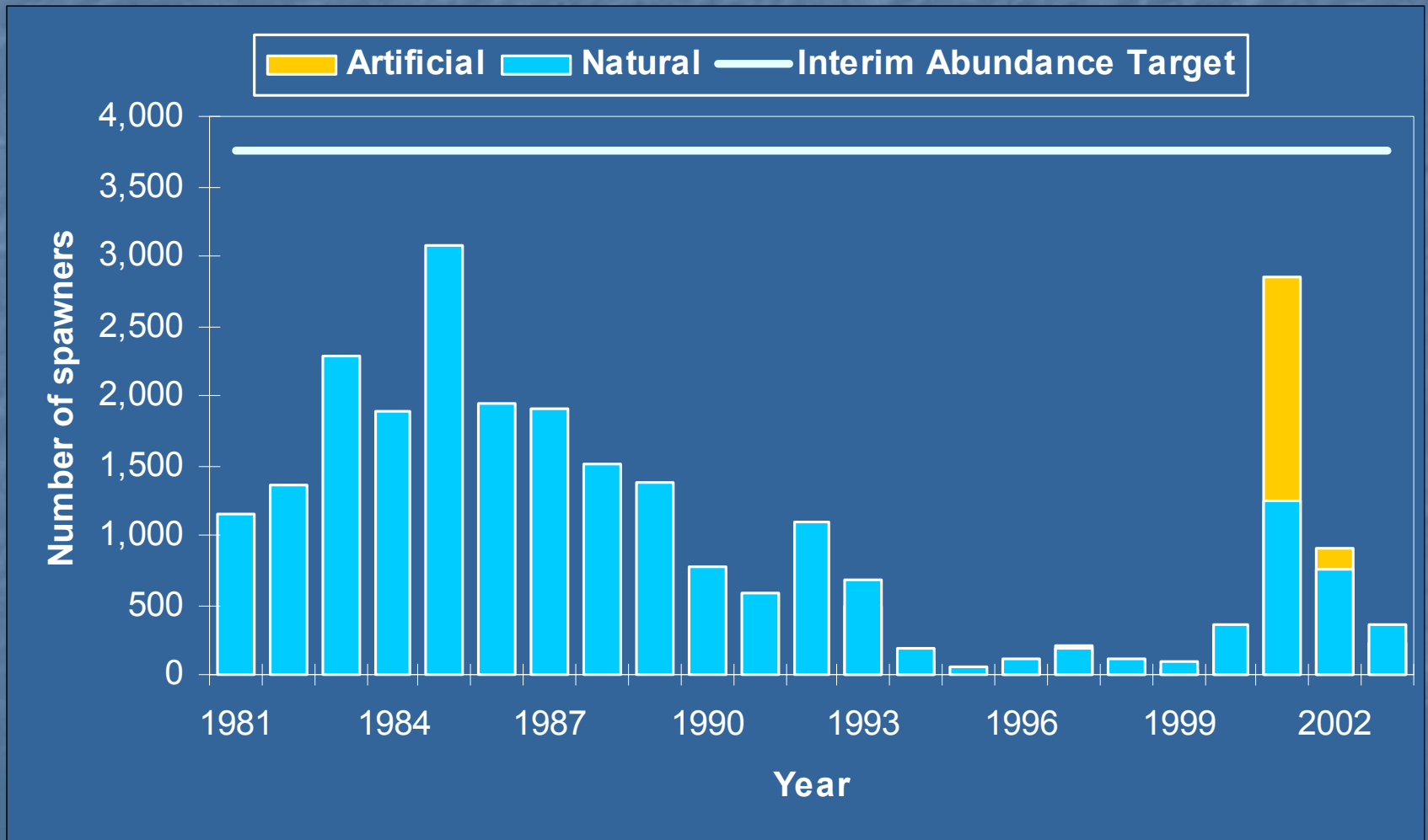
Not Included in the ESU

- Harvest Mitigation Programs
- Isolated from Natural Populations
 - Wenatchee Basin
 - Leavenworth National Fish Hatchery (NFH) \approx 1.26M smolts
 - Entiat Basin
 - Entiat NFH \approx 400K smolts
 - Methow Basin
 - Carson stock at Winthrop NFH being phased out of basin

Methow Basin Escapement



Wenatchee Basin Escapement



"The effects of hatchery fish on the likelihood of extinction of an ESU, depend on how hatchery fish affect four key attributes"



Abundance

- Data indicate that Wenatchee basin programs are increasing the abundance of natural origin salmon
- Methow basin programs do not appear to be increasing the abundance of natural origin salmon – data lacking
- Overall, abundance is increased



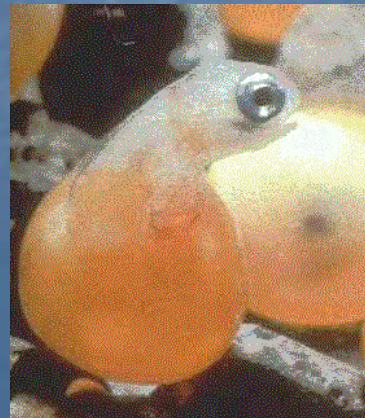
Productivity

- It is uncertain what effect artificial propagation programs are having on the productivity of ESU salmon in the three tributary basins
 - Recent data for the Wenatchee basin indicate that artificially propagated adults are contributing to natural production – study beginning this year
 - Naturally produced adult returns remain low in the Methow basin – data lacking



Spatial Structure

- Wenatchee basin program fish are managed to promote appropriate spatial structure in the basin
- Methow basin programs concentrate spawners near hatchery facilities, altering the spatial structure
- Overall effect is neutral



Diversity

- Wenatchee basin programs incorporate natural origin fish, promotes within population diversity, some fish stray within the basin
- Methow basin programs incorporate few natural fish, dominate on spawning grounds, Carson stock major risk
- Entiat program is an out of ESU stock which may have introgressed or replaced the native population
- Overall, does not moderate risk to the ESU

Effect of Artificial Propagation on VSP Attributes

Viability Criteria	BRT VSP Risk Score	Decreases	Neutral or Uncertain	Increases
Abundance	4.4	✓		
Productivity	4.5		✓	
Spatial Structure	2.9		✓	
Diversity	3.5		✓	
	Endangered	Threatened	Not Warranted	
BRT Findings	54%	43%	3%	

Recommendation: No change from BRT finding